

## CLAIMS

What is claimed is:

1. A voltage regulation system comprising:

a first voltage regulator configured to receive an input voltage from a power  
5 source and to produce a first output voltage for a first electrical circuit;

a controller coupled to the first voltage regulator and configured to change the  
first output voltage to a second output voltage; and

a second voltage regulator configured to receive either of the first output  
voltage or the second output voltage, and to produce a third output voltage for a  
10 second electrical circuit.

2. The voltage regulation system according to Claim 1, wherein the first  
voltage regulator comprises a buck voltage regulator.

3. The voltage regulation system according to Claim 1, wherein the first  
voltage regulator comprises a boost voltage regulator.

4. The voltage regulation system according to Claim 1, wherein the second  
15 voltage regulator comprises a series pass voltage regulator.

5. The voltage regulation system according to Claim 1, wherein the first  
output voltage provides for a higher voltage drop across the second voltage regulator  
than is provided by the second output voltage.

6. The voltage regulation system according to Claim 1, wherein the first  
20 voltage regulator provides for a fourth output voltage, which is less than the first and  
the second output voltages, and wherein the second voltage regulator provides a fifth  
output voltage which is less than the third output voltage.

7. The voltage regulation system according to Claim 1, wherein the first electrical circuit comprises a radio frequency transmitter and the second electrical circuit comprises a radio frequency receiver.

5 8. The voltage regulation system according to Claim 1, wherein the first output voltage provides for a first mode of operation of the first electrical circuit and the second electrical circuit, and the second output voltage provides for a second mode of operation of the first electrical circuit and the second electrical circuit.

10 9. The voltage regulation system according to Claim 8, wherein the first mode of operation provides for radio frequency transmission for the first electrical circuit and standby for the second electrical circuit, and the second mode of operation provides for standby for the first electrical circuit and radio frequency reception for the second electrical circuit.

15 10. The voltage regulation system according to Claim 6, wherein the fourth and the fifth output voltages provide for a third mode of operation of the first electrical circuit and the second electrical circuit.

11. The voltage regulation system according to Claim 10, wherein the third mode of operation of the first electrical circuit and the second electrical circuit comprises a power down mode.

20 12. A method for providing multiple regulated output voltages from a power source, the method comprising:

providing an input voltage from a power source to a first voltage regulator, wherein the first voltage regulator is configured to produce a first output voltage for a first electrical circuit;

controlling the first voltage regulator to produce a second output voltage having a value less than a value of the first output voltage; and

providing either of the first output voltage or the second output voltage to a second voltage regulator, wherein the second voltage regulator is configured to receive either of the first output voltage or the second output voltage and to produce a third output voltage for a second electrical circuit.

13. The method according to Claim 12, wherein controlling the first voltage regulator to produce the second output voltage is performed when the first electrical circuit operates in a mode that does not require the first output voltage.

14. The method according to Claim 12, wherein the second voltage regulator provides a value of power to the second electrical circuit for the second output voltage that is greater than the value of power provided for the first output voltage.

15. The method according to Claim 12, further comprising controlling the first voltage regulator to produce a fourth output voltage having a value less than a value of the second output voltage.

16. The method according to Claim 15, wherein the fourth output voltage provides for a power down mode for the first and second circuits.

17. The method according to Claim 12, wherein the first electrical circuit comprises a radio frequency transmitter and the second electrical circuit comprises a radio frequency receiver.

18. The method according to Claim 17, wherein the first voltage output and the second voltage output are time multiplexed between a first value and a second value.

19. A radiotelephone apparatus comprising:

a power source;

a housing configured to enclose electronic components for receiving and transmitting telecommunications signals; and

5 a voltage regulation system disposed within the housing, comprising:

a first voltage regulator configured to receive an input voltage from the power source and to produce a first output voltage for a first electrical circuit;

10 a controller coupled to the first voltage regulator and configured to change the first output voltage to a second output voltage; and

a second voltage regulator configured to receive either of the first output voltage or the second output voltage, and to produce a third output voltage for a second electrical circuit.

15 20. The radiotelephone apparatus according to Claim 19, wherein the first electrical circuit comprises a radio frequency transmitter and the second electrical circuit comprises a radio frequency receiver.